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FY-70

QUARTERLY REPORT

No. 3

28 February 1970

[redacted]

(1 December 1969 - 28 February 1970)

Prepared by:

[redacted]

25X

Approved by:

5X1

[redacted]

Date: 3/13/70

28 Feb 70

PROGRAM OBJECTIVE

To investigate through studies, tests, and the fabrication and use of engineering breadboard equipment, new methods or devices which will further the state of the art in photographic techniques and practices as it pertains to improved extraction of collected intelligence information from photographic materials.

INTRODUCTION

1. This Quarterly Report No. 3, FY-70 covers progress for the months of December 1969 and January and February 1970. It contains detailed reports on the following active, approved PARs:

a. PAR 249A, Photographic Enlarger Maintenance
b. PAR 251, Image Enhancement Studies Using Ring Smear Techniques
c. PAR 252, Improvement of the Precision Enlarger Fluid Injection System
d. PAR 253, Stereogram Printer Optical Development
e. PAR 254, Technical/Consultative Contractor Services to Improve Production Methods at Customer's Facility

5X1 2. A numerical list of all [redacted] PARs is provided in the Appendix for reference purposes. It indicates the title (abbreviated in some cases) and the current status of each.

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X1 [redacted]

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PAR 249A
28 Feb 70

SUBJECT: Photographic Enlarger Maintenance

TASK/PROBLEM

1. Provide photographic enlarger maintenance at the customer's facility for two [redacted] Precision Enlargers (BPE) and four 10-20-40X Enlargers.

INTRODUCTION

2. During this quarter, scheduled preventive maintenance (PM) was performed as indicated below.

a. Week Beginning	PM Effort Completed
(1) 15 Dec 69	Monthly check on two BPE Enlargers; two-month check on four 10-20-40X Enlargers.
(2) 12 Jan 70	Monthly check on two BPE Enlargers.
(3) 16 Feb 70	Monthly check on two BPE Enlargers; two-month check on four 10-20-40X Enlargers.

b. Details on the above effort are discussed in the next section of this report. Where necessary for clarification, copies of completed PM check lists are attached.

DISCUSSION

3. December Visit. On this visit no discrepancies were noted, either in the monthly PM on the two BPE enlargers, or in the two-month PM on the four 10-20-40X enlargers.

4. January Visit. On this visit, during monthly PM on the two BPE's, a chipped lamphouse gate glass was found on the BPE prototype (SN 001). It will be replaced when the ordered part (glass) is received by the customer. Minor adjustments were made to peak up performance of the SN 001 enlarger.

5. February Visit. On this visit, no discrepancies were noted during two-month PM on the four 10-20-40X enlargers. In monthly PM on the two BPE enlargers, however, the following repairs were necessary on BPE SN 108 and were made:

a. The following items were replaced:

(1) Lamphouse platen

(2) Two lamphouse microswitches

(3) One lens ramp microswitch

(4) The X-coordinate manual control (Pic) belt

b. A filter wheel delay mod kit was installed.

The following discrepancies were noted and corrected on BPE SN 001.

a. The filter wheel drive belt was replaced.

b. A filter wheel delay mod kit was installed.

PLANNED ACTIVITY

6. Contractor personnel will visit the customer's facility during March, April, and May 1970 to carry out scheduled preventive maintenance.

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PAR 249A

28 Feb 70

PREVENTIVE MAINTENANCE SCHEDULE CHECK LIST

X1 | [ ] PRECISION ENLARGER

X1 Assigned to: [ ] Date 12 Jan 70 Machine Serial No. [ ] 25X

Daily Interval

√	Item	Description
√	1	Check the four indicator lamps on the sub-control panel.
√	2.1	Check closed-negative-gate interlock.
√	2.2	Check interlock that causes vertical transport slow speed.
√	2.3	Check interlock that disables negative transport after fluid injection.
√	2.4	Check operation of microswitch that functions when manual-film-movement knob is pushed in.
√	3.1	Check the indicator lamps for the two attenuator banks of the easel photometer.
√	3.2	Check the meter scale illuminator lamp of the easel photometer.
√	3.3	Check the antifatigue lamp in photo-multiplier tube housing.
√	4	Clean the glass plates of the negative gate.

One-Week Interval

√	Item	Description
√	1	Vacuum-clean the enlarger.
√	2	Check, and if necessary, clean the objective lenses and all glass filters.
√	3	Vacuum-clean the front surface of the easel.
√	4	Check the fiber optics for broken fibers.

One-Month Interval

√	Item	Description
√	1	Wax the steel rails of the lens ramp and of the easel.
√	2	Install new air filter in lamphouse.
√	3	Clean the nylon brushes of the fluid removal system.
√	4	Check all tubing and hoses for cracks and air leakage.
√	5	Check and, if necessary, clean the lenses of the condenser lens assemblies.

Six-Month Interval

	Item	Description
	1.1	Make a photographic check on all six matching sets of objective and condenser lens assemblies.
	1.2	Be sure that film is tracking properly in both directions on the negative transport system.
	2	Check the timing belts of the film transport system, of the vertical drive system, and of the easel drive assembly for wear.

Checked by [ ] Date 12 Jan 70 25X

Changed 2/68

REMARKS:

1. Chipped lamphouse gate glass.
2. Adjust fluid pumps.

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GROUP 1
EXCLUDED FROM AUTOMATIC DOWNGRADING AND DECLASSIFICATION

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PAR 249A
28 Feb 70

PREVENTIVE MAINTENANCE SCHEDULE CHECK LIST

X1 [ ] PRECISION ENLARGER

X1 Assigned to: [ ] Date 18 Feb 70 Machine Serial No. [ ] 25X

√	Item	Description

Daily Interval

√	Item	Description
√	1	Check the four indicator lamps on the sub-control panel.
√	2.1	Check closed-negative-gate interlock.
√	2.2	Check interlock that causes vertical transport slow speed.
√	2.3	Check interlock that disables negative transport after fluid injection.
√	2.4	Check operation of microswitch that functions when manual-film-movement knob is pushed in.
√	3.1	Check the indicator lamps for the two attenuator banks of the easel photometer.
√	3.2	Check the meter scale illuminator lamp of the easel photometer.
√	3.3	Check the antifatigue lamp in photo-multiplier tube housing.
√	4	Clean the glass plates of the negative gate.

One-Week Interval

√	Item	Description
√	1	Vacuum-clean the enlarger.
√	2	Check, and if necessary, clean the objective lenses and all glass filters.
√	3	Vacuum-clean the front surface of the easel.
√	4	Check the fiber optics for broken fibers.

One-Month Interval

√	Item	Description
√	1	Wax the steel rails of the lens ramp and of the easel.
√	2	Install new air filter in lamphouse.
√	3	Clean the nylon brushes of the fluid removal system.
√	4	Check all tubing and hoses for cracks and air leakage.
√	5	Check and, if necessary, clean the lenses of the condenser lens assemblies.

Six-Month Interval

	Item	Description
	1.1	Make a photographic check on all six matching sets of objective and condenser lens assemblies.
	1.2	Be sure that film is tracking properly in both directions on the negative transport system.
	2	Check the timing belts of the film transport system, of the vertical drive system, and of the easel drive assembly for wear.

Checked by [ ] Date 18 Feb 70 25X

Changed 2/68

REMARKS:

1. Replace lamphouse platen.
2. Replace two damaged microswitches in lamphouse.
3. Replace one microswitch on lens ramp.
4. Replace X-coordinate manual control (Pic) belt.
5. Install filter wheel delay mod kit.

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PAR 249A
28 Feb 70

PREVENTIVE MAINTENANCE SCHEDULE CHECK LIST

X1 [ ] PRECISION ENLARGER

X1 Assigned to: [ ] Date 18 Feb 70 Machine Serial N[ ] 25X

Daily Interval

√	Item	Description
√	1	Check the four indicator lamps on the sub-control panel.
√	2.1	Check closed-negative-gate interlock.
√	2.2	Check interlock that causes vertical transport slow speed.
√	2.3	Check interlock that disables negative transport after fluid injection.
√	2.4	Check operation of microswitch that functions when manual-film-movement knob is pushed in.
√	3.1	Check the indicator lamps for the two attenuator banks of the easel photometer.
√	3.2	Check the meter scale illuminator lamp of the easel photometer.
√	3.3	Check the antifatigue lamp in photo-multiplier tube housing.
√	4	Clean the glass plates of the negative gate.

One-Week Interval

√	Item	Description
√	1	Vacuum-clean the enlarger.
√	2	Check, and if necessary, clean the objective lenses and all glass filters.
√	3	Vacuum-clean the front surface of the easel.
√	4	Check the fiber optics for broken fibers.

One-Month Interval

√	Item	Description
√	1	Wax the steel rails of the lens ramp and of the easel.
√	2	Install new air filter in lamphouse.
√	3	Clean the nylon brushes of the fluid removal system.
√	4	Check all tubing and hoses for cracks and air leakage.
√	5	Check and, if necessary, clean the lenses of the condenser lens assemblies.

Six-Month Interval

	1.1	Make a photographic check on all six matching sets of objective and condenser lens assemblies.
	1.2	Be sure that film is tracking properly in both directions on the negative transport system.
	2	Check the timing belts of the film transport system, of the vertical drive system, and of the easel drive assembly for wear.

Checked b[ ] Date 18 Feb 70 25X

Changed 2/68

REMARKS:

1. Replace filter wheel drive belt.
2. Install filter wheel delay mod kit.

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PAR 251
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SUBJECT: Image Enhancement Studies Using Ring Smear Techniques

TASK/PROBLEM

1. Design, fabricate, and mount a ring smear device on the BPE breadboard enlarger, and using this equipment:

a. Develop equipment necessary to hold enlarged product and ring smear mask in registration during subsequent printing.

b. Perform image enhancement on selected mission originals.

c. Train selected contractor and customer exploitation personnel in ring smear enhancement techniques.

d. Study operating parameters of ring smear technique with the goal of improving the method.

DISCUSSION

2. Progress and Current Status:

a. The ring smear equipment was mounted on the [redacted] enlarger. This equipment has been aligned optically and the mechanical checkout completed.

25X

b. The first shipment of aerial originals was received on 9 February and test samples of enhanced duplicates are being made.

c. Initial results from the recall negatives were disappointing compared to the enhancement effects observed earlier with laboratory test negatives in the study phase. Part of the problem is thought to be related to the vacuum board contact printer, and a minor modification is being made to increase the clamping pressure. It is expected that the balance of the problem will be solved by additional experimentation with the tilt angle used on the rotating plate, and developing experience at selecting targets that will respond to ring smear enhancement. Experience to date indicates, for example, that targets partially obscured by clouds derive practically no enhancement from ring smear techniques, whereas smeared images respond much better.

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PLANNED ACTIVITY

3. Continue with the preparation of enhanced print samples for customer evaluation: Anticipated shipment of the first samples is the week of 6 April.

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FY-70 Quarterly Report No. 3

PAR 252

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SUBJECT: Improvement of the Precision Enlarger Fluid Injection System

TASK/PROBLEM

1. Develop, fabricate, test, and evaluate an improved fluid-injection-system breadboard that will be compatible with the fluid-gate requirements of both the [redacted] Precision Enlarger (BPE) and the 10-20-40X Precision Enlargers.

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INTRODUCTION

2. Background:

a. During the past few years, Precision Enlargers used in the field have experienced certain failures in the system used to inject refractive index matching fluid into the negative gate. These failures prompted the search for an improved system. As a result, a wide variety of fluid-moving methods were considered as well as the problem of controlling the fluid volume delivered.

b. The purpose of this PAR was: (1) to obtain a system that is highly resistant to the chemical properties of commonly used fluids of the chlorinated-hydrocarbon type, and (2) to provide rapid efficient delivery of fluid to the point of application.

c. Prior to this report period, the breadboard fluid-injection system had successfully undergone considerable testing.

DISCUSSION

3. Progress:

a. The pumping system has been subjected to tetrachloroethylene immersion for about 8 weeks. During this time, it has undergone over 110,000 cycles of test operation designed to simulate the head and delivery requirements of an actual enlarger installation. No observable changes in the hardware occurred.

b. The pumping system was tested for one week with Freon 113 and for another week with trichloroethane. No effects were observed for either of these tests.

c. The system was tested for four weeks with a batch of acidic tetrachloroethylene specially formulated to simulate badly contaminated fluid. Again, no damaging effects were observed.

4. Final-report documentation of laboratory testing effort to date has been started.

PLANNED ACTIVITY

5. Install the fluid-injection-system breadboard on the breadboard [redacted] Precision Enlarger at the contractor's facility. It is thought that the pump system has already demonstrated the desired reliability and durability and that it should now be tested functionally to demonstrate its compatibility with the related liquid-gate-system hardware.

6. By message No. 4272 dated 19 February 1970 the contractor requested an extension of the PAR completion date from 9 March 1970 to 30 June 1970 to permit this additional test activity within the scope of existing funds.

7. Continue final report preparation.

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SUBJECT: Stereogram Printer Optical Development

TASK/PROBLEM

1. Study and evaluate an optical system for the reproduction of a stereo-image pair in stereogram format. Fabricate necessary kluge equipment for conducting necessary photographic tests.

DISCUSSION

2. Introduction:

a. For maximum information retrieval from stereo mission material now being acquired, special complex and expensive stereo registration equipment has been developed. Although this equipment would permit confortable stereo fusion for observers by scale matching and image rectification, its expense restricts its availability to a limited number of users.

b. The importance of making fuller use of currently available stereo materials has recently prompted consideration of combining the registration technique above with a special optical printer system that could produce stereograms* in quantity. This approach, if successful, would make high-quality stereo views of selected targets readily available to PI's for use in low magnification, low-cost, desk-top stereoscopes. It is the intent of this PAR to prove the feasibility of an optical system necessary to the concept of a stereogram enlarging printer.

c. Prior to this report period, design goals were established which the customer felt best fulfilled his needs. Though these represented a more difficult design than the original PAR statement, the customer thought the changes important enough to justify the increased

* Stereogram - A matched pre-aligned stereo pair readily capable of fusion by an observer using a simple stereo viewer.

difficulty. Optical design effort was started, but by the end of the previous quarter, progress had not reached a point where it was possible to make a meaningful performance prediction.

3. Progress:

a. Lens design effort has been concentrated primarily upon the development of a formula for the elements of the zoom magnification system. As design of this system progresses, effort will be put into development of the image rotation and zoom anamorphic elements of the system.

b. On 16 December 1969, the customer visited the contractor's facility. At that time, the following was reported to him:

(1) The present budget for the optical design phase of this PAR would be overrun prior to completion because of the increase in design complexity.

(2) A theoretical evaluation of the formula at this time predicted resolution of 50 to 75 l/mm over the zoom range of 2X to 4X magnification. Prospects for considerable improvement over the 50 to 75 l/mm appeared good.

(3) Another review meeting was scheduled with the customer for about 7 January 1970. It was estimated that by that time the funds budgeted for lens design would be about spent and sufficient progress would have been made to enable the contractor to predict maximum performance potential. The possibility of achieving the design goal of 200 l/mm in actual performance, however, appeared remote.

(4) Effort on this PAR was about one month behind schedule, and further slippage was indicated. Completion of all effort on this PAR by 30 June 1970 appeared unlikely.

(5) A relaxation of the design goals by the customer would allow some undetermined improvement in quality, but would require extra design effort that would extend both the schedule and budget.

The customer agreed that design effort should be continued to the point where best performance was predictable. He also agreed to consider the possibility of modifying project design goals to improve the liklihood of achieving the desired resolution performance.

c. On 15 January 1970, the customer visited the contractor's facility again. At that time, the following was reported:

(1) System capability was evaluated at 150 l/mm minimum on-axis resolution throughout the zoom range, with about 300 l/mm achievable at one point. This evaluation pertained to the zoom magnification part of the system only.

(2) Performance of 200 l/mm throughout the zoom range appeared possible.

(3) Design work had been started on a three-doublet, anamorphic zoom system. Further work on this part of the system was delayed until the zoom magnification system design could be optimized.

d. On 17 February 1970, the customer and his technical consultant revisited the contractor's facility. During the visit, a meeting was held with the contractor's lens design people. The status of the design effort was reviewed in detail. Theoretical performance was as follows:

(1) At 4X, over 200 l/mm on axis to 75% of field radius.

(2) At 2.8X, over 200 l/mm on axis to 50% of field radius.

(3) At 2X, 200 l/mm on axis,
130 l/mm at 40% of field radius,
60 l/mm at 60% of field radius.

This evaluation applied to the zoom magnification system only and did not take into account any degradation that would result from residual aberrations in the anamorphic zoom system. Assuming that the anamorphic system could be designed to perform at about the same level, final system performance would probably be no better than about 70% of these figures. It appeared that the very best that could be expected of the overall system would be 200 l/mm on-axis.

e. At the above meeting, other approaches to the basic system design were also examined. One approach proposed by the customer and his consultant was similar in principle to one that had been considered earlier and rejected. This design would utilize achromatic prisms for the anamorphic system. It would probably not permit the desired 2:1 anamorphic zoom range because of distortion limitations; however, the customer stated that a 0.7 to 1.4 anamorphic zoom range would be acceptable. This type of anamorphic system should be more aberration-free than the cylindrical system that was presently under design. However, the zoom magnification system would have to be redesigned to provide an absolutely parallel light area within which the anamorphic system could operate. It was agreed that this approach would simplify some of the problems which were limiting performance of the in-work design and was therefore worth trying. As a result, optical design effort was redirected to this new approach for about one month to explore its feasibility.

4. Because of the optical design problems described above, fabrication and testing of kluge hardware will not be possible within the time and funds remaining on the contract, and a change of scope was necessary. The customer accordingly requested that the PAR be revised to indicate more accurately the effort that would be accomplished by the contract completion date of 30 June 1970.

PLANNED ACTIVITY

5. Meet with the customer in mid-March 1970 for the purpose of examining progress on the new design approach. It is hoped that at this time it will be possible to predict whether the prospects of meeting the 200 l/mm resolution goal are improved.

6. Submit a revision of this PAR that will more accurately indicate the effort scheduled to be completed by 30 June 1970.

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FY-70 Quarterly Report No. 3

PAR 254

28 Feb 70

SUBJECT: Technical/Consultative Contractor Services to Improve Production Methods at Customer's Facility

TASK/PROBLEM

1. Perform studies and conduct experimental investigations for improvement of production methods and techniques at NPIC that would:

a. Permit direct coupling into an integrated National distribution plan, and

b. Increase production quality and efficiency.

2. Determine the changes in equipment, material, personnel and/or procedure that would be required to achieve the above.

3. Provide technical and/or consultative services, personnel training support, and samples of materials as available and appropriate to achieve the above.

DISCUSSION

4. Black-and-White Production at NPIC

a. Introduction. During the past few months, several requests for high contrast duplicate positives (contact and enlargement) of certain low contrast target areas in past missions were received from the customer. These requests were satisfied by using fine-grained, high-contrast duplicating 6451 (Recordak Minicard Film) and SO-369 (Recordak Print Film). These copies provided B-213 photointerpreters with additional intelligence data over what was obtained in the standard 2430 duplicating film system. It was requested that NPIC Photo Lab be given the capability to print and process 6451 and SO-369. The following discusses the visit to NPIC Photo Lab to introduce these new products.

b. Printing and Processing of 6451 and SO-369. Photo Lab personnel were given a package of data containing process control curves, printer control curves and tone reproduction curves for both films. A process and printer were brought into control according to these standards and a typical "flat" original negative was printed onto each of the two films. The advantages of these products were evident from the duplicate positives printed.

c. Special Considerations. Artifacts (e.g. measles, Newton rings, non-uniformity, etc.), associated with high-contrast, fine-grained duplicating films, were pointed out and explained. Lab personnel were also given a set of curves showing the differences in contrast between contact and enlargement prints on 6451 and SO-369 from the same original negative.

d. Intended Applications. The Lab Chief mentioned, with some concern, that the Photo Lab does not usually receive the original negative until about 6 weeks after acquisition and that any special prints, required by their photointerpreters before this time, would have to be from the duplicate negative. It was pointed out that the original intent of this program is to give each lab which has access to the original negative the capability of printing and processing from the original negative, depending on which lab has the original negative at the time a special print is needed. The dupe negative route could be used in an emergency if more information is gained than by standard duping methods. Additional investigation would be required.

e. Conclusion. In general, Photo Lab personnel felt that the new high-contrast films offered their lab another tool for improving the reproduction of low contrast imagery which may not have been possible with their present duping methods. They were satisfied with the informational package that was provided.

5. Color Production at NPIC

a. Color enlargements onto Ektacolor paper from [redacted] 25X were made from 1X internegatives supplied by the contractor on Eastman Color Internegative Film 7271. As a result of customer feedback concerning the undesirable low contrast of the internegatives [redacted] 25X the internegatives supplied on [redacted] 25X were processed to a higher over-all contrast. Customer reaction indicated that these internegatives were more favorable. Efforts between the contractor and customer will continue in order to realize further improvements in internegatives supplied from SO-242 color originals.

b. The major effort expended this period was devoted toward the investigation of systems to produce high quality color prints at NPIC for the production of annotated briefing boards and viewgraphs. Various products

have been reviewed for consideration along with techniques to produce inserts and annotations, in an effort to formulate an over-all system capable of high-quality prints that are compatible with production facilities at NPIC. Some of the products under investigation are shown in Figure 1. The survey illustrated in Figure 1 has been designed primarily to determine those products most suitable for use in producing enlargements from SO-242, and does not show inserts or procedures to produce annotations. Methods to include inserts and annotations will be tried with those products shown to be most suitable for production of enlargements.

PLANNED ACTIVITY

6. Black-and-White

a. Prepare an informational package on Kodak Direct Duplicating Aerial Film (Estar Base) SO-239, similar to the one delivered on 6451 and SO-369 duplicating films.

b. Continue efforts to satisfy requirements for training as provided by the PAR.

c. Assist Photo Lab to re-establish capability for printing and processing duplicating film to contractor 2430 standards.

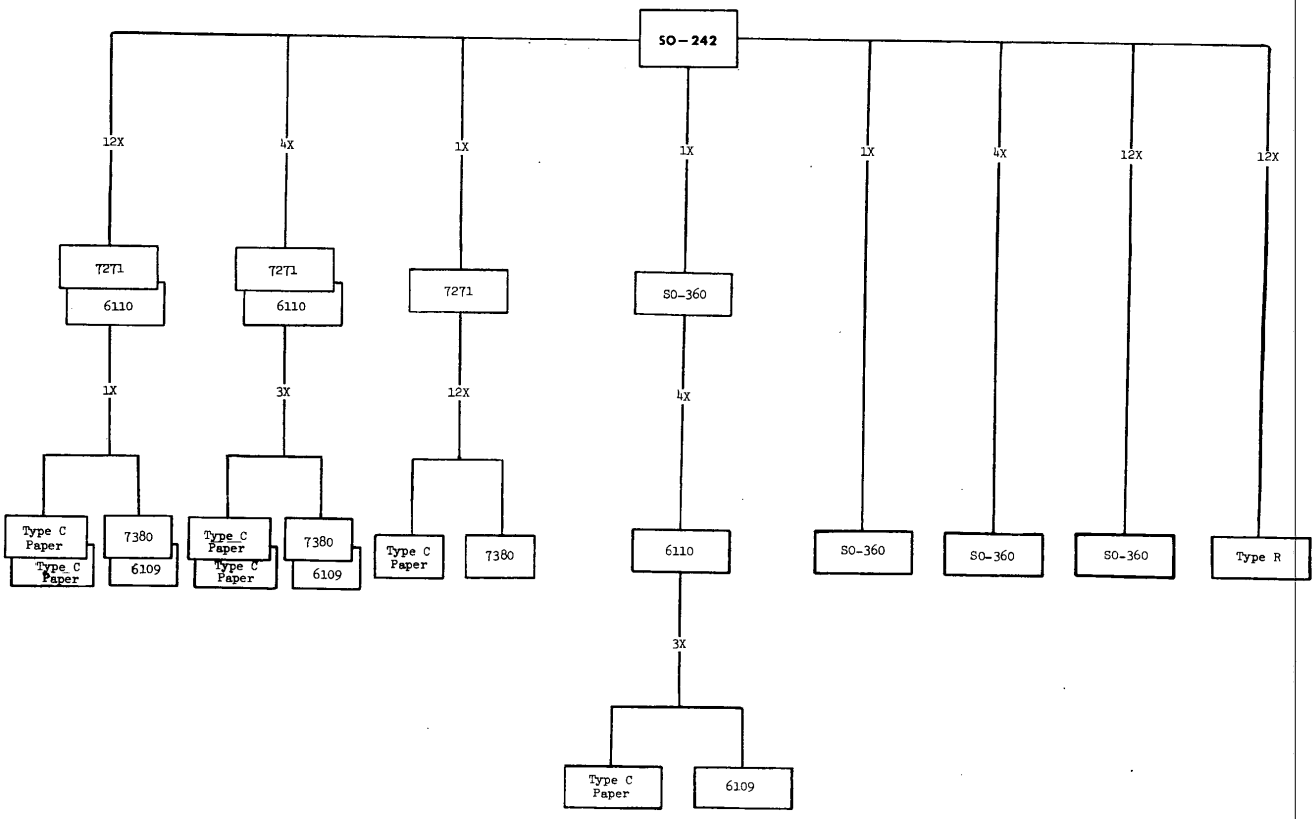
7. Color

a. Review and summarize data from studies of various products under consideration for use in the production of briefing boards and Vu-graphs.

b. Draft recommendations for systems to be used in the production of briefing boards and Vu-graphs at NPIC.

c. Prepare samples of these proposed systems for presentation at NPIC. This will be scheduled for early April so that any system, if accepted, can be utilized on the next color mission.

Figure 1



APPENDIX

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APPENDIX

NUMERICAL LIST OF CONTRACT [redacted] PARs

25X

PAR	Title	Status
201	Travel and Liaison	Active
X1 202/224	[redacted] Precision Enlarger/* 3X - 15X Enlarger	Completed/TWX 6351 dtd 21 Jan 66
203	Rapid Access Printer	Completed 4 Aug 65
204	Contact Chip Printer	Termination Rpt completed 27 Jan 65
205	Precision 4X Enlarger	Termination Rpt completed 27 Jan 65
206	Reversal Processing Study	Completed 21 May 65
207	Contact Printer Study	Completed 6 Apr 66
208	Non-Elec. Image Enhancement	Cancelled
209	Phosphor Viewer	Cancelled
210	Laminated Slides	Completed 4 Sep 64
211	Processing Effects Study	Completed 28 Oct 65
212	Color Acq. System Review	Completed 28 Oct 65
213	Color Reprod. Review	Completed 13 Aug 65
214	Roller Transport Processor (12-Inch)	Closed/TWX 7284 dtd 23 May 66
215	Roller Transport Processor (24-Inch)	Closed/TWX 7284 dtd 23 May 66
216	Laser Photographic Exposure	Completed 12 Feb 65
217	Optimization of Lasers	Completed 9 Nov 65
218	Autofocus Systems	Not to be submitted
219	Opt. vs Contact Pg. 1:1	Not to be submitted
220	Static Elec. Hold-Down	Disapproved

* Formerly called the Briefing Print Enlarger.

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PAR	Title	Status
221	Lens Bench Manual	Not to be submitted
222	Auto Stereo Regstrn System	Completed 3 Mar 65
223	Monochr. Lens System	Disapproved
225	Micro-D Training Program	Terminated
226	Edge Trace Meas., Micro-D	Completed
227	Color Viewer	Disapproved
228	Vectograph Study	Not to be submitted
229	Optical Design Film Viewer	Not to be submitted
230	10X Color Lens	Disapproved
231	10-20-40X Color Lamphouse	Disapproved
232	Automated Edge Trace Device	Disapproved
233	Zoom (6X to 60X) Projection Lens	Terminated/TWX 7878 dtd 26 Jul 66
234	MTF Exposure Device	Disapproved
235	Automation Program Study	Disapproved
236	Film Disposal Rewind Unit	Disapproved
237	Briefing Aids	Completed 25 Jul 65
238	Equipment Installation	Closed/TWX 7284 dtd 23 May 66
239	Administration	Closed
~~240~~	~~Not Assigned~~	-
~~241~~	~~Not Assigned~~	-
242A	Color Demonstration Material	Completed 29 Mar 66
243A	[redacted] Precision Enlarger*	Completed 22 Sep 67
244	Spare Parts for RT Processors	Completed 21 Nov 67
245	BPE High Magnification Lens Sets	Completed 26 Mar 68
246	RT-12 and RT-24 Operational Improvements	Completed 25 Feb 68

* Formerly called the Briefing Print Enlarger.

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	PAR	Title	Status
	247	Base Spare Parts Kit	Completed 25 Nov 68
	248	BPE High-Magnification Lens Set	Completed 15 Nov 68
X1	249	[redacted] Precision Enlarger Prototype (BPE) Operational Improvements and Maintenance	Completed 30 June 69
	249A	Photographic Enlarger Maintenance	Active
X1	250	[redacted] Precision Enlarger Mod II (Prototype)	Disapproved
	251	Image Enhancement Studies Using Ring Smear Techniques	Active
	252	Improvement of Precision Enlarger Fluid Injection System	Active
	253	Stereogram Printer Optical Development	Active
	254	Technical/Consultative Contractor Services to Improve Production Methods at Customer's Facility	Active
	255	Preparation of Simulations of High-Altitude Photography	Awaiting Customer Action